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**CLAIM TO PRIORITY**

Sir:

Submitted herewith in the above-identified application, through the undersigned attorney, Applicants hereby request that their above-identified application be treated as entitled to the right accorded by Title 35, U.S. Code, Section 119, to EPO Patent Application No. 02080033.0, filed December 2, 2002, a certified copy of which is enclosed.

Respectfully submitted,

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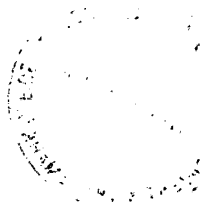

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# Bescheinigung | Certificate | Attestation

Die angehefteten Unterlagen stimmen mit der ursprünglich eingereichten Fassung der auf dem nächsten Blatt bezeichneten europäischen Patentanmeldung überein.

The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

**Patentanmeldung Nr. | Patent application No. | Demande de brevet n°**

02080033.0

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

Le Président de l'Office européen des brevets
p.o.

**R C van Dijk**

Anmeldung Nr:
Application no.: 02080033.0
Demande no:

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Anmelder/Applicant(s)/Demandeur(s):

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se referer à la description.)

Filled sugar confectionery articles

In Anspruch genommene Priorität(en) / Priority(ies) claimed /Priorité(s) revendiquée(s)
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# FILLED SUGAR CONFECTIONERY ARTICLES

## TECHNICAL FIELD OF THE INVENTION

The present invention relates to filled sugar confectionery articles such as gums like wine gums, jellies, toffees, caramels, marshmallows, hard boiled sweets, nougats, preferably wine gums. In particular, the present invention relates to a process for making the outer shell of said sugar confectionery articles.

## BACKGROUND OF THE INVENTION

Wine gum is the common name for sugar confectionery gum based on gelatin or on a combination of gelatin and starch. When based on pectin, agar and the like, the product is often referred to as jellies. These products can also be modified to contain a low amount of filling such that they typically consists of an edible shell and a liquid filling. The liquid provides depending on the nature of the filling a pleasant soothing effect on the throat or a flavouring or acidulating effect in the mouth.

Products in the form of cough drops have long been known as vehicles for the delivery of medicaments aimed at soothing sore or irritated throats. Products in the form of aroma drops have also long been known and have now been in rising demand by consumers.

Further, there is a need among consumers for a filled sugar confectionery which provides a full mouth of liquid filling.

In addition, it has been found that the liquid filling enhances the juicy character of the product, especially for fruit flavours products. Accordingly, it is an object of the invention to provide filled sugar confectionery with a good juicy character.

Typical process for making such liquid filled sugar confectionery when the confectionery is a hard candy or a chewy candy is by extrusion and rope-forming

processes such as described in US 6,280,762. Filled wine gum, on the other hand are typically made by a depositing process.

However, a problem with these type of processes is the amount of filling that can be incorporated. Hence, the filling is often in an amount such that the weight ratio of filling to the outer shell is below 0.3. As a result, the perception of the filling in the mouth upon opening of the shell is well below the consumer's expectations.

Still another problem encountered with these processes, in particular with the extrusion process, is that the viscosity of the filling and of the shell are similar. This is an important requirement for the production process. As a result of this, the perception of the juicy character is diminished.

Accordingly, it is an object of the present invention to provide filled sugar confectioneries which provide an improved perception of liquid filling in the mouth.

Still another problem with these type of processes is the tendency of such product to give rise to the leakage of their filling upon storage. The reason for this leakage is believed to be due to the location of the centre where the filling is incorporated. Indeed, current processes have a tendency to produce filled confectionery where the centre is not often centred. As a consequence, the shell presents a non-uniform resistance to the pressure from the filling, thus producing weakened shell which lead to leakage of the filling upon storage.

Accordingly, it is also an object of the present invention to provide filled sugar confectioneries with reduced leakage of the filling upon storage.

A solution to such a leakage problem would be to provide a protection surrounding the shell, such as for example by coating the shell. However, whilst this solution would provide a solution to the leakage problem, this would not only rise the cost of production of said confectionery but also even lower the perception of full mouth filling.

It has now been found that the application of a cold member to a preheated confectionery mass, wherein such cold member has a temperature lower than minus 50°C, fulfils such needs.

Application of a cold mould member is known in the art of chocolate confectionery. Hence, EP 0,589,820 describes that a cold mould member preferably in a form of a cone is applied to a tempered mass of chocolate mixture, wherein the cold mould member has a temperature below 0°C, preferably ranging between minus 15°C and minus 30°C.

However, it has been found by the present inventors that application of such cold mould member was detrimental to the obtention of outer shells made of sugar confectionery mass. Hence, it resulted in the sticking of the sugar confectionery mass to the cold member mould thus preventing its removal and as a result preventing the formation of an outer shell.

One solution to this problem that was suggested by the inventors of the present application was to replace the iron cone as described in EP 0,589,820 by a Teflon cone. Teflon is known for its anti-sticking properties. However, despite the known anti-sticking properties of Teflon, the sugar confectionery mass was still found to stick to the member having a temperature range between minus 15°C and minus 30°C.

Thus, based on the above mentioned experiments, it can then be concluded that a solution known for chocolate manufacture is not transposable to the field of confectionery manufacture. Indeed, it is known that application of chocolate techniques process are not that easily transposed to confectionery as these have different compositions and different mechanism of setting. Setting is defined as the transformation from the liquid to the solid state. For chocolate, this solidification takes place by fat crystallisation, whereas for sugar confectionery, setting takes generally place by viscosity increase on cooling due to the use of a super-saturated sugar solution, i.e. containing from 60 to 99% by weight of the mass of sugar. In the specific case of gums such as winegums and jellies, the viscosity increase will form a gel, i.e. a three-dimensional network. In other words, heated chocolate will upon cooling

crystallise thereby giving its desired appearance whereas for sugar confectionery, it is not crystallisation that is desired but viscosity increase by use of a super-saturated sugar solution.

Despite this known prejudice, it has now been surprisingly found by the present inventors that the application of a cold member having a temperature of lower than minus 50°C avoids the sticking of the sugar confectionery mass to the cold member.

## SUMMARY OF THE INVENTION

In one aspect of the present invention, there is provided a process for producing outer shells of sugar confectionery articles, wherein a cooling member is immersed into a pourable or aerated sugar confectionery mass prior to its solidification and is kept in the mass in a fully immersed position for a predetermined period of time to define a predetermined shell volume, the cooling member having a temperature lower than minus 50°C, and the pourable or aerated sugar confectionery mass solidifying, under cooling, inwardly to form the outer shape of the shell.

In another aspect of the present invention, there is provided an apparatus for producing sugar confectionery articles comprising mould cavities to receive a confectionery mass, the mould cavities having a shape corresponding to the outer shape of the finished shells, characterized in that the system moreover comprises cooling members having an outer shape corresponding to the internal shape of the finished shells, and that the cooling members are cooled to a temperature lower than minus 50°C and then immersed into the mass and kept in it in a fully immersed position for a predetermined period of time to define a predetermined shell volume between said member and the mould cavity.

In a further aspect of the present invention, there is provided filled sugar confectionery articles obtainable by the invention process, wherein the weight ratio of filling to the outer shell is within the range of 0.5 to 5.

## BRIEF DESCRIPTION OF THE DRAWING

Figure 1 is a schematic side view of a mould for forming a cold member.

## DETAILED DESCRIPTION OF THE INVENTION

Pourable or aerated sugar confectionery mass

A pourable or aerated sugar confectionery mass is an essential element of the present invention.

By "pourable", it is meant that the (pre-heated) mass is a liquid (rather than a powder) and that it can be removed from its container by holding the container upside down without having to use any force other than gravity. In the event of the mass not being pourable at room temperature or even to make the mass more pourable, a pre-heating step is then preferably applied to the mass, thereby making the mass (more) pourable. Preferred heating ranges are in the boiling ranges, more preferably in the range of from 107 to 165°C.

By "aerated", it is meant a mass having a density of less than about 1 g/cc, preferably of from 0.1 to 1g/cc, and more preferably from 0.1 to 0.4g/cc. Typical products having such densities are marshmallows made by an extrusion process.

For the purpose of the present invention, the sugar confectionery mass comprises as a main ingredient sugar.

By "sugar", it is meant ingredients selected from sucrose, glucose, lycasine, xylitol, mannitol, other polyhydric alcohols, dipeptide sweeteners, and mixtures thereof.

Commercial grade glucose (dextrose) such as spray dried corn syrup solids produced by Corn Products Co. (France) and having a particle size specification of "MOR SWEET"™ 4x size has been determined to be a satisfactory component of the formulation.

In those formulations, where a low nutritive value is desired, agents such as dipeptide sweeteners, particularly L-aspartyl-L-phenylalanine, methyl ester, saccharine, cyclamates, glycyrrhizin and other non-nutritive sweeteners can also be employed, particularly with a modified polydextrin or glucose polymer as a bulking agent.

Typical levels of sugar are of from 50 to 99% by weight, based upon the total weight of the mass taken as 100% by weight. Preferably, for gum and jellies, the amount of sugar is of from 70 to 85% by weight. For hard boiled candies, levels of sugars of from 80-99% by weight are preferred.

There should also be sufficient water present in the mixture so that the total mixture moisture content is from about 1-30% by weight based upon the total weight of the mixture taken as 100% by weight. Preferably, for gum and jellies, the total mixture moisture content is of from 15 to 30% by weight. For hard boiled candies, a total mixture moisture content of from 1-3% by weight is preferred.

Although optional, the addition of a binder to the sugar confectionery mass is advantageous as it will improve the structure of the confectionery mass. More preferably, the binder is used as an aqueous solution. When present, the binder is typically selected from edible grade gelatin, gum arabic, pectin, agar, starch, and mixtures thereof. Most preferred binders for use herein are edible grade gelatin and/or gum arabic. Most preferably, where gelatin is the binder, an aqueous solution of gelatin having a water content of approximately 67% by weight is used as the binder. In those instances where gelatin is the binder it is the aqueous solution of gelatin that furnishes the bulk of the water essential to forming the mass of homogenized ingredients when mixed at the low temperatures (60C). In the instance where gum arabic is the binder, it is employed as a 50% aqueous solution and can advantageously replace glucose in some formulations particularly those in which sucrose is not employed as the sweetener.

When necessary, minor adjustment in moisture content of the paste can be effected by the addition of water. Preferably, the binder is present within the confectionery mass at a level of from 0.5 to 50% by weight, preferably 0.5 to 10% by weight.

Addition of other optional may also be added to the confectionery mass. Typical of such optional are selected from fat, coloring agents, flavoring agents, acidulating agents and mixtures thereof.

For the most part, the addition of any fat to the formulation for the processing of the confectionery is optional and, for confectionery of low caloric content, is eliminated. The fat content can be eliminated or increased to within the below-mentioned range because it has little, if any, influence on the flavor or textural properties even when at the maximum value of the range. The primary purpose of the fat is to facilitate the machine wrapping of the candy product and a food grade hydrogenated palm oil as a component in the formulation has been determined to be satisfactory for this purpose. When present, the level of optional fat is within the range of from 0 to 35% by weight, preferably 1 to 35% by weight.

The coloring, flavoring and acidulating agents employed in the confectionery formulation are the same as those employed in the prior art conventional process for making soft candy and are well known to those skilled in the confectionery manufacturing art. Preferred levels for coloring agent, when present, are of from 0.001 to 1% by weight. Flavoring agents, when present, are preferably within the range of from 0.1 to 3% by weight. For acidulating agents, it is preferred, when they are present, that these are present at levels of from 0.2 to 2% by weight.

As the mixture of the ingredients are processed under boiling temperature conditions (107°C-165°C) it is essential that all ingredients be pure and of edible grade and processing conditions be maintained in a strict sense of cleanliness in order to minimize any contamination. A small, but effective, amount of antibacterial agent can be employed in the formulation when use of lower temperatures are employed.

With respect to processing to obtain a pourable sugar confectionery mass, basically the process entails making a mix of the sugar and optionals if any. The mix is thoroughly blended at a temperature in the range of from 107°C-165°C in order to make the super-saturated sugar solution with the desired moisture content as defined hereinbefore.

Where gelatin is used as a binder, it is preferred to make separately the super-saturated sugar solution at a temperature of 107°C-165°C and the gelatin solution at a temperature around 60°C prior to the mixing of the solutions. The temperature of the resulting solution is then at a temperature of 100°C or above and suitable for further processing. On cooling the viscosity of the mass will slowly increase and at a temperature below 35°C, preferably between 30 and 35°C, the gelatin will form a gel (3-dimensional structure) and as a result turn the mass into a solid. For processing purposes, it generally not recommended to keep the boiled sugar/gelatin mixture for a too long time at such a high temperature, especially when the mixture contains acids, as the gelatin would gradually lose its gelling behaviour. Accordingly, a storage temperature of about 60°C for several hours is recommended.

With respect to processing to obtain an aerated sugar confectionery mass, basically, the process entails making the pourable sugar confectionery mass as described above, cooling it down to 45°C-50°C, aerating the mass up to the desired density, and shaping the product to its desired form by an extrusion process.

A cooling member is then immersed into the obtained pourable or aerated sugar confectionery mass prior to its solidification and is kept in the mass in a fully immersed position for a predetermined period of time to define a predetermined shell volume, the cooling member having a temperature lower than minus 50°C, and the pourable or aerated sugar confectionery mass solidifying, under cooling, inwardly to form the outer shape of the shell.

By "cooling member" or also called herein "cold member", it is meant a substance which is able upon contact with the pourable mass or aerated product to set said mass or product whilst non sticking to the contacted surfaces. This is preferably achieved by use of a component that is solid at a temperature lower than minus 50°C but gaseous at room temperature (25°C).

Preferably, where the confectionery mass is the preheated confectionery mass as above described, it is poured into a mould cavity to which is thereafter immersed, i.e. prior to the cooling off of the mass, a cooling member having a temperature lower than minus

50°C, preferably a temperature within the range between minus 70°C and minus 250°C. The cold member is kept in the mass for a predetermined period of time to define a predetermined shell volume between said member and said mould cavity. This provides a rapid solidification of the mass from the cooling member and outwardly will release the cooling member, which can be lifted up and out of the mould cavity. The shell can then be further processed. Depending on the composition of the mass, solidification can take place through setting, i.e. immobilisation in case of gum and jellies, or even viscosity increase upon cooling in the case of toffees and caramels.

The mould cavity is preferably one of many cavities in a mould plate which is made of hard polycarbonate and/or rubber, preferably of rubber. Rubber is a preferred material of use for the mould cavity in view of its flexible and water-repellent properties, thus making it suitable for application of a confectionery mass. As the set product does not stick to the material, the product can therefore be pushed out of the cavity without destroying the final product.

For the clarity of the description, only one mould cavity is described in the form of a mould plate and one overlying cooling member which are involved in the system. However, this system can involve, of course, many cooling members and underlying mould plates, which are either continuously moved past below the cooling members and are kept stationary when confectionery shells are moulded, or which are advanced synchronously with the cooling members. The system comprises means for controlling the up and down movement of the cooling members as well as residence times in the fully immersed position in the mould cavities as well as means for controlling the advancing movements of the mould plates. The arrangement of the male part in the lower part can be adjusted.

Preferably, the amount of confectionery mass which is filled is just slightly, preferably only 10% lower than the volume of the finished shell. Accordingly, as the cooling member is lowered down into the confectionery mass to a fully immersed position to define a predetermined shell volume between said member and the mould cavity, the amount of confectionery mass will spread up to the upper edges of the shell but not

along. By such means, an outer shell is obtained which is easy to fill in but also easy to cover.

A preferred predetermined period of time is of from 10 to 30 seconds. However, the residence time may vary from 1 to 60 seconds, according to the shape and size of the shell as well as the prepared state of the confectionery mass. Further, it is believed that the residence time may also depends to some extent from the density of the cold member. Accordingly, it would result that a more dense carbon dioxide would reduce the residence time.

The cooling member may be shaped in any form suitable to impart the inner shape of an underlying mould cavity, i.e. may be shaped as a male part having an outer shape.

As described hereinbefore, the cooling member has a temperature of lower than minus 50°C, preferably between minus 70 and minus 250°C. This low temperature is preferably obtained by use of solid carbon dioxide, more preferably selected from dry ice and dry snow which have a temperature of minus 78°C.

When desired, especially with the use of dry snow, the cooling member may be provided by use of a mould in a predetermined shape such as a male part having an outer shape corresponding to the inner shape of an underlying mould cavity. In this mould is then injected the cooling member in gas form which upon release of the pressure causes a temperature drop that solidifies carbon dioxide into dry snow of temperature of minus 78°C and shaped according to the mould. In this instance, the mould is preferably made of a material that is able to withstand the high pressure caused by the injection of the cooling member. Typical of materials for such a mould are selected from iron, steel like stainless steel, and mixtures thereof. A preferred material for use as material of the cold member mould is stainless steel.

The cold member mould is preferably equipped with at least one outlet (8). This outlet enables the liberation of the pressure which is present upon introduction of the cooling member into the mould, and thereby providing for example the solidification of liquid carbon dioxide.

Once moulded, the cold member is removed from the mould and immersed in the sugar confectionery mass. Removal from the mould is preferably made via a removal means like a stick (10) which is inserted into the mould prior to the cold member injection into the mould. Preferably, the removal means is provided at its bottom, i.e. a few millimetres above the end of the removal means, with horizontal extensions so as to ensure that the cold member, in particular the dry snow does not easily fall off.

The external face of the cooling member or mould may also be provided with depressions or recesses to form corresponding elevations, such as in the form of ribs, partitions or text on the internal face of the shell.

In particular, in Fig. 1 is shown a schematic side view of such a mould comprising two upper parts (1) and (2) and one bottom part (3), all of which being made of stainless steel, and the three parts being secured one with each other by securing means (4) such as screws. The bottom part (3) contains a cavity (5) for receiving a screw (6) and a mould cavity (7). The upper part (1) contains an outlet (8) for insertion of a screw (6), the outlet (8) also enabling the release of the pressure caused by the injection of the cooling member, and the outlet (8) being in connection with the cavity (5) to enable insertion of the screw (6). In the upper part (2) is contained an outlet (9) which in addition to the release of the pressure and gas can also serve for insertion of a cold member removal means (10) like a stick, as well as a pipe (11), the outlet (9) being in connection with the mould cavity (7). Also contained in the upper part (2) is a pipe (11) to conduct the cold member (12) in gas form contained in container (13) via conducting means (14) to the mould cavity (7), the pipe (11) being at 45° from the surface of the upper part (2).

Alternatively, a predetermined shaped mould in the form of the desired outer shell can be immersed in the cold member in liquid or gas form according to the invention for an amount of time sufficient to form a coating of cold member on the external surface of the mould which has been immersed into the cold member. Preferably, immersion is made on at least 50% of the mould surface, more preferably at least 80%, and most preferably the whole mould external surface.

Once the cold member is obtained, it is immersed into the sugar confectionery mass to define a predetermined shell volume. Immersion will preferably occur prior to the cooling off of the sugar confectionery mass, preferably after obtention of the sugar confectionery mass, i.e. subsequent to the obtention of the confectionery mass. Alternatively, the mass can be kept pourable such as by keeping the mass to the temperature range at which the mass is pourable, i.e. between 107-165°C.

Once the outer shell is obtained, the shell will be filled with a filling composition made of edible ingredients. Suitable edible ingredients are selected from sugar, edible binders, food coloring, flavoring, edible acidulant, and mixture thereof. As described hereinbefore, the coloring, flavoring and acidulating agents employed in the confectionery formulation are the same as those employed in the prior art conventional process for making soft candy and are well known to those skilled in the confectionery manufacturing art.

It is however important that the filling composition has a water activity in the range of from 0.3 to 0.75g/ml. Indeed, below such minimum water-activity, the perception of the filling becomes too spongy instead of juicy to be appreciated by consumers whilst water-activity higher than the maximum value, a tendency for microbiological spoilage will occur.

Preferably, the filling composition has a viscosity in the range of 1-60 Pa.s when measured with a Bohlin rheometer type VOR (plate-plate system with a diameter of 3cm), measured at a temperature of 25°C, rotation speed being 10 rotations per second (rps), i.e substantially equivalent to the shear rate that can be expected in the mouth on chewing a foodstuff. Still, the viscosity of the filling can further be reduced by increasing the temperature of the filling to a level at which the material of the shell would melt. Preferably, the temperature can be increased to a range of from 40 to 50°C.

Further, it is also preferred that the water-activity of the shell and that of the filling are substantially the same. By substantially, it is meant water-activity that do not differ by

more than 10%. Indeed, by having such substantial similar water-activity level, the problem of moisture transfer is minimised.

Once filled, the shell is closed with a confectionery mass. It is not necessary that the closing is made of the same ingredient as the outer shell, although it is preferred for economical reasons and practical reasons to use the same confectionery mass as the one making up the outer shell.

Accordingly, there is provided a process for producing filled sugar confectionery articles, in particular filled wine gum, which comprises the steps of

1)- making an outer shell as per above described;

2)-filling the shell with edible ingredients, preferably selected from food coloring, flavoring, edible acidulant, and mixture thereof, the filling composition having a water activity in the range of from 0.3 to 0.75g/ml;

3)-closing the shell with a confectionery mass.

Apparatus

Also provided herein is an apparatus for producing sugar confectionery articles, in particular wine gum articles, comprising mould cavities to receive a confectionery mass, the mould cavities having a shape corresponding to the outer shape of the finished shells, characterized in that the system comprises cooling members having an outer shape corresponding to the internal shape of the finished shells, and that the cooling members have a temperature lower than minus 50°C and are then immersed into the mass and kept in it in a fully immersed position for a predetermined period of time to define a predetermined shell volume between said member and the mould cavity. All of these elements have been described in details hereinbefore, the description of these elements being applicable to the apparatus.

As described above, it is preferred that the amount of sugar confectionery mass which is filled is just slightly, preferably only 10% lower than the volume of the finished shell. Accordingly, as the cooling member is lowered down into the confectionery mass to a fully immersed position to define a predetermined shell volume between said

member and the mould cavity, the amount of confectionery mass will spread up to the upper edges of the shell.

Filled confectionery

By use of the present invention, filled confectioneries are obtained which contain a high amount of filling compared to current prior art of filled confectioneries. Hence current prior art processes have usually a weight ratio of filling to the outer shell of less than 0.3, and in particular for filled wine gum a weight ratio below 0.1. This is regarded by consumers as insufficient for providing a full mouth filling.

Accordingly, there are provided filled confectioneries obtainable by the invention process and having a weight ratio of filling to the outer shell within the range of 0.5 to 5.

Examples

The following is a non-limiting example according to the present invention.

A-Filling composition

A filling composition was as follows:

Table 1

| Ingredients | % by weight |
|---|---|
| High maltose glucose syrup (40 DE/82% dry substance) | 80 |
| Sorbitol solution (70% dry substance) | 20 |

The filling composition was made by mixing together the above mentioned ingredients at a temperature of 50°C. Once a thin homogenous mixture was obtained, the following ingredients as given in Table 2 were added to the filling composition while stirring. The amounts in Table 2 are by weight of the resulting filling composition, i.e. filling composition with ingredients of Table 2.

Table 2

| Ingredients | % by weight |
|---|---|
| Lemon flavour | 0.2 |
| Raspberry flavour | 0.15 |
| Citric acid (50% sol.) | 1.0 |
| Minors (Titanium dioxide) | qs* |

*qs: "quantum satis"

Where a transparent filling is desired, Titanium dioxide is not used.

B-Shell composition

Table 3

| Ingredients- Mix 1 | amount in grams |
|---|---|
| water | 300 |
| Sorbitol solution (70% dry substance) | 60 |
| Gelatine 180 BI | 100 |

Table 4

| Ingredients- Mix 2 | amount in grams |
|---|---|
| sugar | 400 |
| water | 150 |
| glucose syrup (35 DE) | 400 |

The ingredients of mix 1 for making the gelatin solution were heated in a water bath at 60°C for 30 minutes while stirring, after which time, the foam formed was removed.

The ingredients of mix 2 for making the super-saturated sugar solution were then boiled until 125°C while stirring. Once the set temperature of 125°C was obtained, the mix 2 was ready for further processing, i.e. had the right moisture content of 6.8%.

Heated mix 1 was thereafter added to the boiled mix 2 and stirred. The resulting mixture was placed in a warm waterbath until all air bubbles had reached the mixture surface. The air bubbles foam were then removed.

The resulting mixture was distributed into 200g portions and to each portions was added minor amounts of flavours, colour and acid as given in Table 5 and stirred until a homogenous mixture was obtained. The amounts in Table 5 are by weight of the final confectionery composition, i.e. resulting mixture (mix 1 and 2) above mentioned that has been previously boiled, having a weight of 772g with ingredients of Table 5.

Table 5

| Ingredients | % by weight |
|---|---|
| Raspberry flavour | 0.2 |
| Citric acid (50% sol.) | 1.0 |
| Lactic acid (60% sol., buffered) | 1.0 |
| Raspberry dried fruit flakes | 2.0 |
| Minors (Red Colour) | qs* |

*qs: "quantum satis"

The obtained mass was poured into rubber moulds of desired shape to which was thereafter immersed, until setting of the mass, a preformed ice or snow. The preformed ice was hand made to the desired shape whereas the preformed snow was made using the cold member mould as shown in Figure 1 letting the liquid/gaseous carbon dioxide (12) to go through the pipe (11) into the cavity (7) where it became solid. The preformed snow was then removed from its mould and immersed into the confectionery mass. Once the mass was set, traces of ice or snow were removed before depositing the filling. The filled shell was then closed by pouring a mass as made for the outer shell. The finished filled shell was then allowed to set before being demoulded from the rubber mould.

The obtained wine gum had a weight ratio of filling to the outer shell of about 1, provided a good mouth filling perception and enhanced juicy character.

CLAIMS

1- A process for producing outer shells of sugar confectionery articles, wherein a cooling member is immersed into a pourable or aerated sugar confectionery mass prior to its solidification and is kept in the mass in a fully immersed position for a predetermined period of time to define a predetermined shell volume, the cooling member having a temperature lower than minus 50°C, and the pourable or aerated sugar confectionery mass solidifying, under cooling, inwardly to form the outer shape of the shell.

2- A process according to claim 1, wherein a mould cavity is filled with the pourable confectionery mass and wherein the cooling member is immersed into the mass prior to its solidification after this has been filled into the mould cavity and is kept in the mass in a fully immersed position for a predetermined period of time to define a predetermined shell volume between said member and the mould cavity.

3- A process according to either one of Claim 1 or 2, wherein the cooling member has a temperature between minus 70°C and minus 250°C.

4- A process according to any one of Claims 1-3, wherein the cooling member is selected from solid carbon dioxide, preferably selected from dry ice and dry snow.

5- A process according to any one of Claims 1-4, wherein the cooling member is provided in a predetermined shape by use of a mould.

6- A process according to Claim 5, wherein the material of the cooling member mould is selected from iron, steel, and mixtures thereof, preferably is stainless steel.

7- A process according to either one of Claim 5 or 6, wherein the cooling member mould is equipped with at least one outlet (8).

8- A process for producing filled sugar confectionery articles, in particular filled wine gum, which comprises the steps of

1)- making an outer shell as per defined in any one of Claims 1-7;

2)-filling the shell with edible ingredients, preferably selected from food coloring, flavoring, edible acidulant, and mixture thereof, the filling composition having a water activity in the range of from 0.3 to 0.75g/ml;

3)-closing the shell with a confectionery mass.

9- Apparatus for producing sugar confectionery articles comprising mould cavities to receive a confectionery mass, the mould cavities having a shape corresponding to the outer shape of the finished shells, characterized in that the system moreover comprises cooling members having an outer shape corresponding to the internal shape of the finished shells, and that the cooling members have a temperature lower than minus 50°C and are then immersed into the mass and kept in it in a fully immersed position for a predetermined period of time to define a predetermined shell volume between said member and the mould cavity.

10- Apparatus according to Claim 9, wherein the apparatus is provided with means for controlling the residence time in fully immersed position.

11- Apparatus according to either one of Claim 9 or 10, wherein the cooling member is as defined in any one of claims 1-5.

12- Filled confectionery obtainable by the process of Claim 8, wherein the weight ratio of filling to the outer shell is within the range of 0.5 to 5.

ABSTRACT

There is provided a process for producing outer shells of filled sugar confectionery articles, wherein formation of the confectionery mass is obtained via a cooling member having a temperature lower than minus 50°C. Apparatus for carrying out the process are also herein provided as well as filled confectioneries obtainable by the process.